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# *Altigena malihkaia*, a new species of Labeonini (Teleostei: Cyprinidae) from the Irrawaddy River basin in Myanmar

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## Abstract

*Altigena malihkaia*, new species, is described from the Mali Hka River, a tributary of the Irrawaddy River in northern Myanmar. It is distinguished from all other species of the genus *Altigena* by having a combination of 45–49 lateral-line scales, 12–14 circumpeduncular scales, 17–20 pre-dorsal midline scales, wide head (96.8–138.5% HL), long postorbital length (64.6–81.0 % HL), and short dorsal-fin (length 21.9–26.2% SL).

**Key words:** Taxonomy, Cypriniformes, Mali Hka River

## Introduction

*Bangana* was erected as a subgenus of *Cyprinus* by Hamilton (1822) and further defined by Rainboth (1996) and Kullander *et al*. (1999). A total of 23 species of *Bangana* was recognized by Zhang and Chen (2006). Lately, *Bangana ariza* has been placed into *Gymnostomus*, and *Bangana behri* has been placed into *Incisilabeo*, (Kottelat & Steiner 2010; Yang *et al*. 2012). Recently, *Bangana musaei* has been revised as *Speolabeo musaei* (Kottelat 2017). Moreover, Kottelat (2017) revised *Bangana* according to the molecular results of Yang *et al*. (2012). Five species of *Bangana* were recognized as *Bangana* sensu stricto, the remaining species with continuous postlabial groove were revalidated as *Altigena* Burton, 1934. Up to now, eight species were certainly included within *Altigena.* During the expedition in Myanmar in 2014, several batches of specimens were collected and identified as an undescribed species of *Altigena*. All share the generic characters with species of *Altigena*, but are distinguished from all known species. We describe it as a new species herein.

## Material and methods

Measurements were made with digital calipers point to point with an accuracy of 0.1 mm. Traditional counts and measurements follow Kottelat (2001) except that counts of fin rays follow Chu and Chen (1989), and the addition of the following measurements: pre-dorsal, pre-pectoral, pre-pelvic, pre-anal lengths and lateral-line scale count follow Zheng *et al*. (2016). Vertebrae are counted from radiographs taken by a Digital Cabinet X-ray System (Xpert 80, Kubtec). Examined specimens are in the collection of the Southeast Asia Biodiversity Research Institute, Chinese Academy of Sciences (SEABRI) and the Kunming Institute of Zoology, Chinese Academy of Sciences, Kunming (KIZ). Data for unavailable species followed the references as follows: *A. discognathoides* from Nichols and Pope (1927) and Zhang *et al*. (2000), *A. elegans* from Kottelat (1998), *A. sinkleri* from Fowler (1934), and *A. zhui* from Zheng and Chen in Zheng (1989). Abbreviations used in the text are: SL, standard length and HL, lateral-head length.

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***Altigena malihkaia* sp. nov.**
(Figs. 1–4)

**Holotype.** SEABRI 2016000004, 122.7 mm SL; Putao market, Kachin State, Myanmar, August, 2016.

**Paratypes.** KIZ 20140063, 096–097, 3 ex. 74.6–98.6 mm SL, Putao market, Kachin State, Myanmar, December, 2014; SEABRI 2015000001–007, KIZ 20150263–264, KIZ 2015005389, 10 ex., 92.0–167.5 mm SL, Putao market, Kachin State, Myanmar, December, 2015; SEABRI 2016000001-003, KIZ 20160294, 4 ex. 89.2–162.0 mm SL, Putao market, Kachin State, Myanmar, August, 2016.

**Non-types.** SEABRI 20170184–185, 2 ex., 72.6–144.9 mm SL; Mali Hka River, a tributary of Irrawaddy River, 27°38'51"N 97°22'34"E, Kachin State, Myanmar, 6 December 2017.

**Diagnosis.** *Altigena malihkaia* **sp. nov.** is distinguished from all other genera of Labeonini by the combination of a thick, pendulous rostral fold, upper lip closely adnate to upper jaw, upper and lower lips continuous around corner of mouth, continuous postlabial groove, pair of mental grooves, one pair of maxillary barbels, and 10–11 branched dorsal-fin rays. It differs from the congeneric species by having 12–14 circumpeduncular scales, 17–20 pre-dorsal midline scales, wide head (96.8–138.5% HL), longer postorbital length (64.6–81.0% HL), and short dorsal fin (21.9–26.2% SL).

**TABLE 1.** Morphometric data for type specimens of *Altigena malihkaia* **sp. nov.**

| n=18 | 17 paratypes and the holotype | | | |
|---|---|---|---|---|
| Characters | Holotype | Range | Mean | SD |
| Standard length (mm) | 107.6 | 74.6–167.5 | - | - |
| Total length (mm) | 136.4 | 95.1–223.2 | - | - |
| **Percentage of SL** | | | | |
| Body depth | 24.1 | 20.1–24.5 | 22.4 | 1.36 |
| Head length | 23.0 | 18.9–23.0 | 20.5 | 1.10 |
| Head depth | 15.6 | 13.6–16.4 | 15.1 | 0.78 |
| Head width | 14.3 | 13.9–17.2 | 15.3 | 0.91 |
| Dorsal-fin length | 26.2 | 21.9–26.2 | 24.1 | 1.17 |
| Pectoral-fin length | 21.4 | 17.8–22.7 | 20.6 | 1.25 |
| Pelvic-fin length | 17.7 | 16.8–21.6 | 18.8 | 1.20 |
| Anal-fin length | 21.5 | 18.9–21.7 | 20.2 | 0.95 |
| Caudal-peduncle length | 16.3 | 16.3–21.8 | 18.2 | 1.26 |
| Caudal-peduncle depth | 15.1 | 11.8–15.2 | 13.5 | 0.82 |
| Predorsal length | 43.7 | 43.6–49.4 | 46.1 | 1.81 |
| Prepectoral length | 22.1 | 19.6–22.1 | 20.9 | 0.85 |
| Prepelvic length | 54.9 | 48.8–55.2 | 52.6 | 2.02 |
| Preanal length | 76.4 | 68.3–77.7 | 72.5 | 2.99 |
| **Percentage of HL** | | | | |
| Snout length | 43.8 | 41.9–55.5 | 47.7 | 3.87 |
| Head depth | 67.6 | 67.4–80.0 | 73.7 | 3.88 |
| Eye diameter | 19.7 | 18.8–26.4 | 22.0 | 2.19 |
| Interorbital width | 39.4 | 39.4–56.3 | 48.5 | 4.12 |
| Head width | 103.3 | 96.8–138.5 | 112.2 | 9.31 |
| Postorbital length | 66.9 | 64.6–81.0 | 72.4 | 4.38 |

**Description.** Morphometric data are listed in Table 1. Body rounded and caudal peduncle compressed, abdomen smooth. Deepest part of body usually in front of dorsal-fin origin. Head rounded, depth smaller than width. Snout moderately rounded, length longer than postorbital length. Small distinct keratinized tubercles

densely set on tip of snout. Eye moderately large, diameter 18.8–26.4% HL, in posterior half of head, close to dorsal profile. Largest specimen 167.5 mm SL; 45 vertebrae (KIZ 2015005389, n=1) (Fig. 3).

**FIGURE 1.** Lateral view of *Altigena malihkaia* **sp. nov.**, paratype, SEABRI 2016000003, 154.4 mm SL.

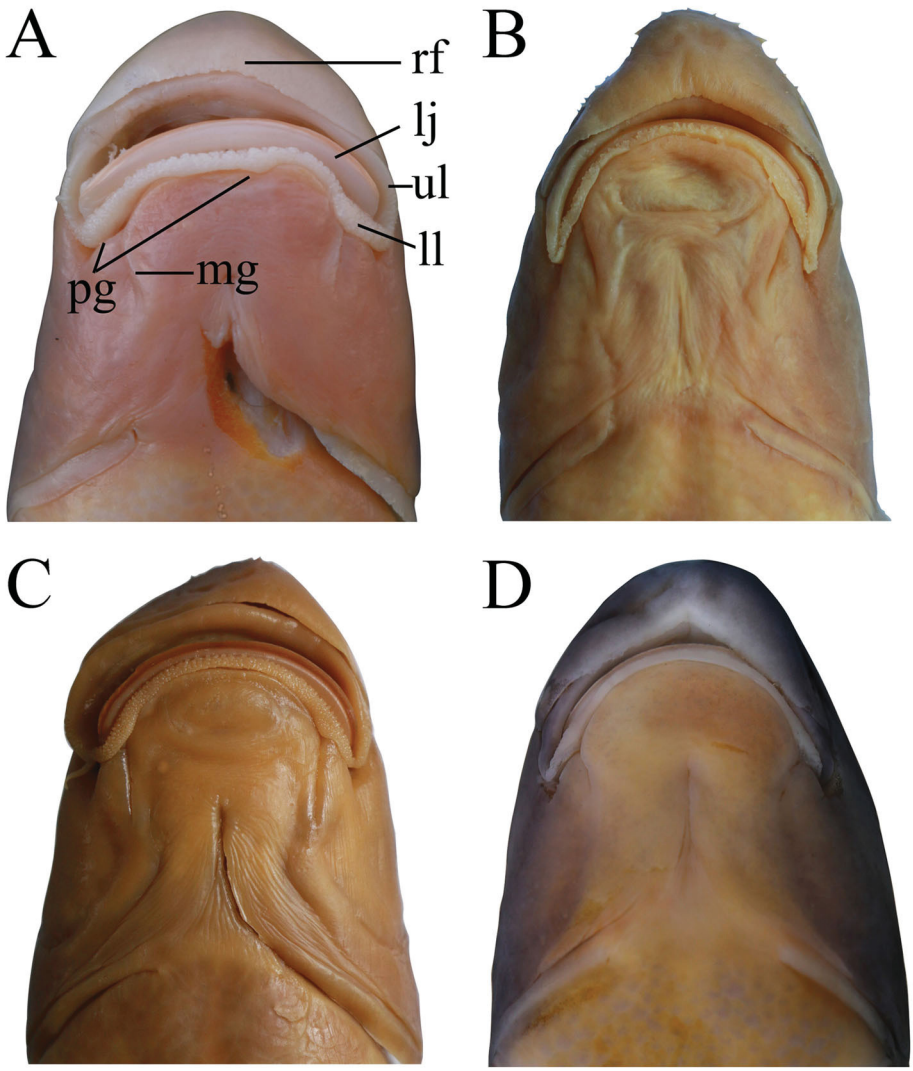


**FIGURE 2.** Oromandibular structures of *Altigena*: (A) *A. malihkaia* **sp. nov.**, SEABRI 2016000003, 154.4 mm SL; (B) *A. tonkinensis*, KIZ 200401163, 135.4 mm SL; (C) *A. wui,* KIZ 776521, 188.6 mm SL; (D) *A. yunnanensis*, KIZ 20160172, 368.3 mm SL. rf = rostral fold; ul = upper lip; lj = lower jaw; ll = lower lip; mg = mental groove; pg = postlabial groove.

Mouth inferior (Fig. 2). Rostral fold thick, pendulous, shallowly crenulated medially, smooth laterally, edge of upper lip exposed. Upper lip closely adnate to upper jaw and easily overlooked, except at lateral-most extremities. Upper and lower lips continuous around corner of mouth. Edge of lower jaw keratinized, blunt and crescentic, conspicuously exposed, separated from lower lip by deep groove. Lower lip with band of papillae along anterior edge. Posterior groove deep and continuous. Pair of mental grooves present on lower lip, connected with postlabial grooves. Pair of very short maxillary barbels. Maxillary barbels slender, weak, shorter than eye diameter, at corner of mouth. Three rows of pharyngeal teeth: 5.4.2 (KIZ 20150264, n=1) or 5.3.3 (KIZ 20150263, n=1).

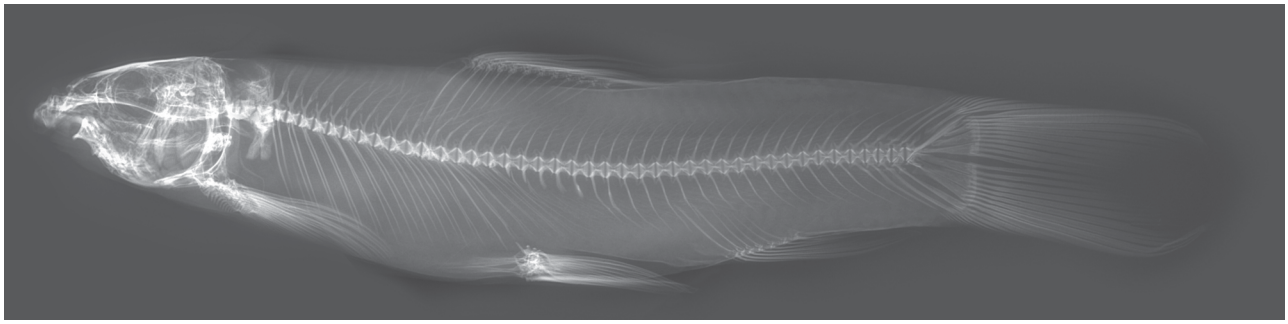

**FIGURE 3.** Radiograph of *Altigena malihkaia* **sp. nov.**, KIZ 2015005389, paratype, 107.6 mm SL.

**FIGURE 4.** *Altigena malihkaia* **sp. nov.**, alive, SEABRI 20170184, 144.9 mm SL.

Dorsal fin with 3 soft unbranched rays and 10–11 branched rays, origin nearer tip of snout than caudal-fin base, margin concave. Anal fin with 3 unbranched and 5 branched rays, margin concave, tip exceeding halfway between anal-fin and caudal-fin bases, but not reaching caudal-fin base. Pectoral fin with 12–14 branched rays, exceeding halfway between pectoral-fin and pelvic-fin origins. Pelvic-fin with 8–9 branched rays, origin posterior to dorsal-fin origin, tip exceeding halfway between pelvic-fin and anal-fin origins, not reaching anal-fin origin in large individuals, reaching in specimens less than 93 mm SL. Axillary pelvic lobe present. Anus closer to anal-fin origin than to posterior endpoint of pelvic-fin base. Distance from anus to anal-fin nearly equal to eye diameter. Caudal fin with 9 upper + 8 lower branched rays, forked, upper lobe slightly shorter than lower lobe.

Scales large, scales of abdomen embedded under skin. Pre-dorsal midline scales 17–20, smaller than flank scales, somewhat irregular, not embedded under skin. Lateral line complete and straight, ending at caudal-fin base; 45–49 lateral-line scales; 5–6 scale rows between lateral line and origin of dorsal-fin; 4–5 scale rows between lateral line and origin of pelvic-fin; 12–14 circumpeduncular scales.

**Colouration.** In preserved specimens, body dark brown dorsally, light brown ventrally. Black blotch on flank above pectoral fin and on caudal-fin base, their width equal to 3 scales. Fin-rays black, membranes hyaline. Body of live olive green, with light purple sheen on scales, paired fins orange (Fig. 4).

**Distribution and ecology.** *Altigena malihkaia* is known only from the upper reach of Mali Hka River, a tributary of Irrawaddy River in Myanmar (Fig. 5). This species occurs in the sluggish zone of the main stream at an altitude of 539 meters, particularly in areas about 2–3 meters deep. The substrate of the river consists of boulders, cobble and sand (Fig. 6). Syntopic species include *Devario fangae*, *Tor qiaojiensis*, *Neolissochilus compressus*, *Garra salweenica*, and *Pterocryptis berdmorei*.

**Etymology.** Named for the type locality, the Mali Hka River. To be treated as a noun in apposition.

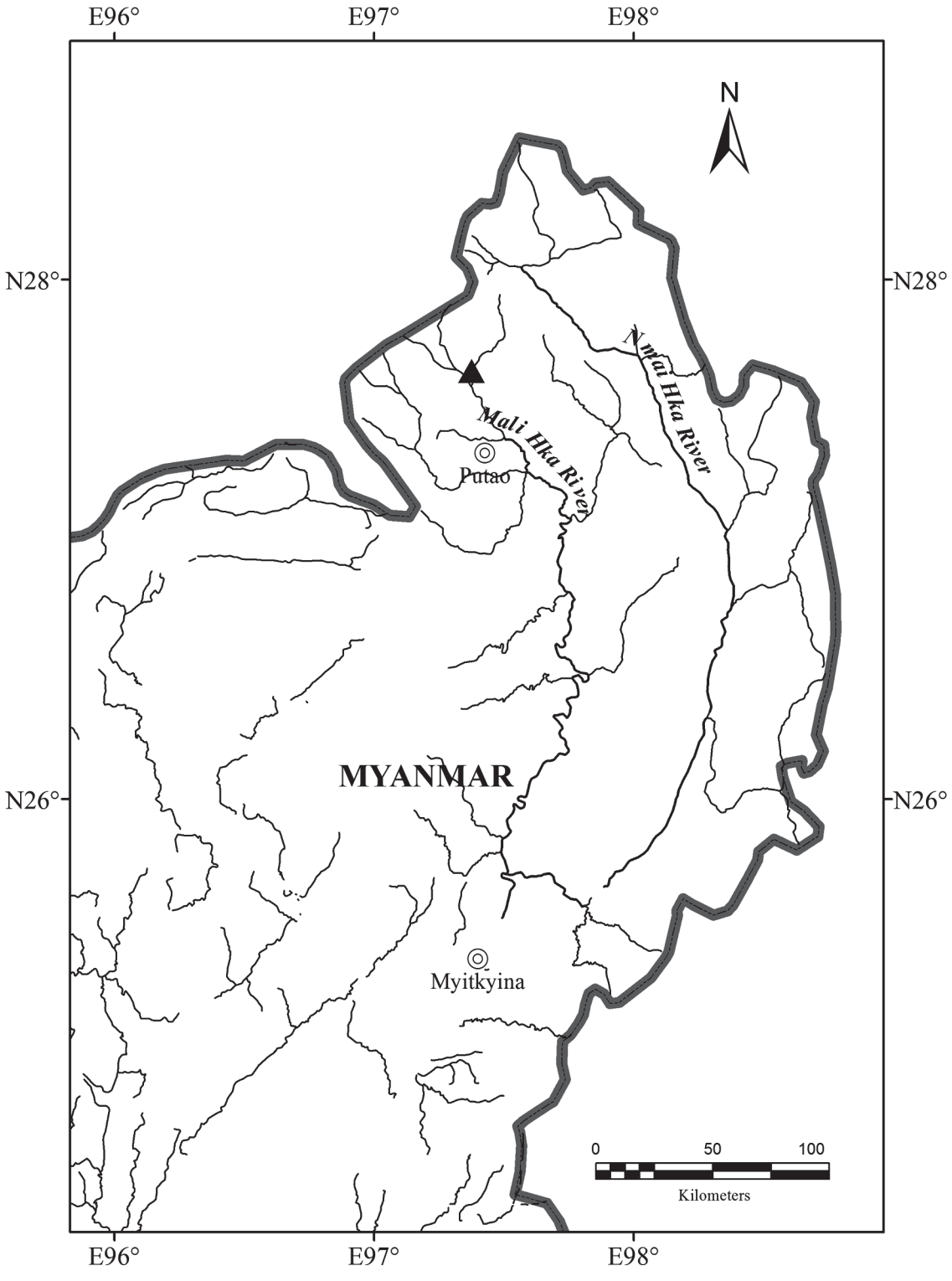


**FIGURE 5.** Distribution of *Altigena malihkaia* **sp. nov.**

**FIGURE 6.** Habitat of *Altigena malihkaia* **sp. nov.**, Mali Hka River.

## Discussion

According to Kottelat (2017), eight species are included in *Altigena*: *A. tonkinensis* (Pellegrin & Chevey 1934), *A. lippa* (Fowler 1936), *A. discognathoides* (Nichols & Pope 1927), *A. elegans* (Kottelat 1998), *A. sinkleri* (Fowler 1934), *A. wui* (Zheng & Chen 1983), *A. yunnanensis* (Wu *et al*., in Wu 1977), and *A. zhui* (Zheng & Chen, in Zheng 1989). *Altigena tonkinensis* and *A. lippa* have 20 circumpeduncular scales, and the other species have 16 circumpeduncular scales. The new species has 12–14 circumpeduncular scales, which can be used to distinguish it from these species. *Altigena malihkaia* can be further distinguished from *A. tonkinensis*, *A. lippa*, *A. elegans*, *A. sinkleri*, *A. discognathoides* and *A. wui* by having more lateral-line scales (45–49 vs. 31–35 in *A. elegans*, 33–34 in *A. sinkleri*, 38–39 in *A. discognathoides*, 41–45 in *A. wui*, 39–42 in *A. lippa*, 43–44 in *A. tonkinensis*); more predorsal midline scales (17–20 vs. 12 in *A. elegans*, 10 in *A. sinkleri*, 12 in *A. discognathoides*, 14–16 in *A. wui*, 13–15 in *A. tonkinensis*, 15–16 in *A. lippa*); wider head (96.8–138.5% HL vs. 65.7–71.0% in *A. tonkinensis*, 63.5–69.8% in *A. wui*, 66.5–70.7% in *A. lippa*); longer postorbital length (64.6–81.0% HL vs. 33.7–40.8% in *A. tonkinensis*, 36.1–42.4% in *A. wui*, 36.9–40.8% in *A. lippa*); shorter dorsal-fin length (21.9–26.2% SL vs. 29.3–34.8% in *A. tonkinensis*, 28.6–32.4% in *A. wui*, 26.3–36.3% in *A. lippa*); and shorter head (13.6–16.4% SL vs. 16.4–18.4 in *A. wui*). *Altigena malihkaia* further differs from *A. yunnanensis* and *A. zhui* by having fewer predorsal midline scales (17–20 vs. 23–24 in *A. yunnanensis*, 24–26 in *A. zhui*); longer postorbital length (64.6–81.0% HL vs. 37.4–40.6% in *A. yunnanensis*, 37.0–41.7% in *A. zhui*); wider head (96.8–138.5% HL vs. 68.4–77.4% in *A. yunnanensis*); shorter dorsal-fin length (21.9–26.2% SL vs. 27.2–29.2% in *A. yunnanensis*); and larger eye (diameter 18.8–26.4% HL vs. 12.3–14.9% in *A. zhui*). Up to now, *A. lippa*, has been the only congeneric species recorded from Myanmar (Kottelat 2013), and they can be readily distinguished from each other. The discovery of the new species adds one more species record in Myanmar.

## Comparative material

*A. lippa*: KIZ 197800799, 1981001234, 2008077, 2008078, Xishuangbanna, Yunnan, China. *A. tonkinensis*: KIZ

200401163, Mojiang, Yunnan; KIZ 200401085, Lvchun, Yunnan; KIZ 2007234, Jiangcheng, Yunnan; KIZ 20055362, Jinping, Yunnan, China. *A. yunnanensis*: KIZ 734094, Menghan, Yunnan; KIZ 735090, Mengyang, Yunnan; KIZ 200402024, Manwan, Yunnan; KIZ 20160172, Gongguoqiao, Yunnan, China. *A. wui*, KIZ 1988001760, 761, 786, Guanling, Guizhou; KIZ 20060074, Zhenning, Guizhou; KIZ 776521, Guangnan, Yunnan, China.


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